



CLIMATE ADAPTATION VS CLIMATE MITIGATION

Sponsored by the AABE LIPP Committee

Wednesday, April 8, 2020 from 2:00 PM to 3:00 PM (EST)

Due to the progression of climate change around the world, those at the forefront of mitigation are also championing substantive adaptation measures, recognizing that even if we ceased all greenhouse gasses today, global warming would progress for decades. As ocean waters rise and weather patterns change, every continent will be adversely impacted— changing immigration patterns, agricultural supply, employment, and business. This webinar will explore how experts are meeting today's challenges and prioritizing adaptation and mitigation strategies.



Deidre Sanders, (Ph.D.)
Founder, Deidre Sanders, LLC

Dr. Deidre Sanders is Founder of her consulting firm of the same name. She is an Environmental Justice (EJ) subject matter expert. Her experiences include PG&E where she advanced the implementation and institutionalization of Environmental Justice Policy, climate EJ, and policy strategy. Deidre also worked in Environmental Affairs, Community Involvement, and Market Research for Southern California Edison. She was Director of Government and Community Affairs, and Director of Public Policy at East Bay Community Energy. She has served on the USEPA, National Environmental Justice Advisory Council (NEJAC).

Climate Mitigation v Adaptation:

Effects and Opportunities for Black Communities

Deidre Sanders, PhD
Founder and CEO,
Deidre Sanders, Inc

Mitigation v Adaptation

Not really a binary choice and in the context of climate change these concepts must work together. First, reduce effects (i.e., “mitigate”), then adjust to what cannot be avoided, reduced, or relieved.

Mitigate

To make less severe or intense.

Synonyms: **relieve, alleviate.**

Adapt

To modify; to make fit based on changing circumstances.

Synonyms: **conform, adjust, accommodate**

White America's Inconvenient Truth and Black America's Incontrovertible Trouble

As the saying goes, “When White America gets a cold, Black America gets pneumonia.” Conventional wisdom says Black communities generally experience societal adversity more acutely than White communities. This holds true for how climate change is expected to impact Black communities in the US and beyond.

- Higher household energy cost burden;
- Slower/lagging conversion to renewable energy resources;
- Increasingly concentrated costs for maintaining conventional energy resources;
- Disaggregation of energy generation may create new inequities for Black communities.

Two Concurrent Discussions

Climate change policy has brought efforts to restructure the energy sector. As a result, we are discussing new ideas on how we produce, use, and pay for energy.

Energy Costs

- % of household income
- % of business revenue
- % of costs that go to system maintenance
- % of costs that go to tariffs
- % “other” costs (EX. debt, shareholders, labor, regulatory compliance, etc.)

Energy Access

- Electric v Gas
- Renewables – Residential or Utility
- Public v Private
- Scale: Local Microgrids or Regional IOUs?
- Regulatory Structure
- Financial Incentives

Energy Burden for Black Low-Income HH

TABLE ES1. Median income, utility bill, energy burden, and unit size for households based on income type, building type, building ownership, and household race for groups across all metro areas

	Household type	Median annual income	Median size of unit (square feet)	Median annual utility spending	Median annual utility costs per square foot	Median energy burden ¹
Income type	Low-income ² (≤80% AMI) ³	\$24,998	1,200	\$1,692	\$1.41	7.2%
	Non-low-income	\$90,000	1,800	\$2,112	\$1.17	2.3%
	Low-income multifamily (≤80% AMI)	\$21,996	800	\$1,032	\$1.29	5.0%
	Non-low-income multifamily	\$71,982	950	\$1,104	\$1.16	1.5%
Building ownership	Renters	\$34,972	1,000	\$1,404	\$1.40	4.0%
	Owners	\$68,000	1,850	\$2,172	\$1.17	3.3%
Head of household race	White	\$58,000	1,600	\$1,956	\$1.22	3.3%
	African-American	\$34,494	1,290	\$1,920	\$1.49	5.4%
	Latino	\$39,994	1,200	\$1,704	\$1.42	4.1%
All households	N/A	\$53,988	1,573	\$1,932	\$1.23	3.5%

¹Energy burden is the percentage of household income that is spent on energy bills. To calculate median energy burden, we calculated energy burden for all households and then took the median. This value differs from the median energy burden that is calculated using median annual utility spending and income.

²Low-income includes both single- and multifamily households. ³Area median income (AMI) is the median dollar amount that divides the population into two equal parts.

Source: American Housing Survey (Census Bureau 2011 and 2013a).

Community-Owned Microgrid Concepts

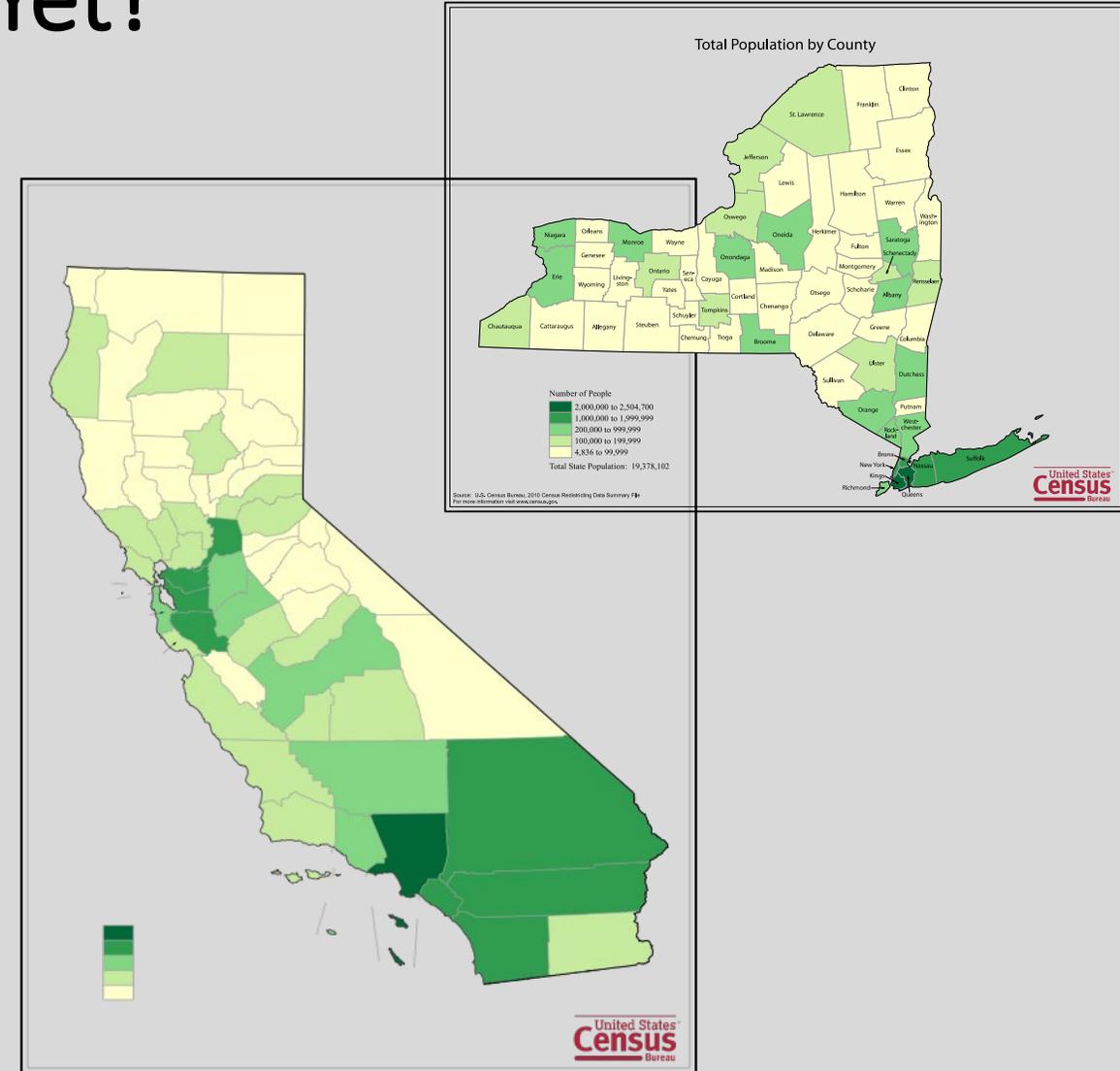
“Communities” produce power for their consumption and sale by creating:

- 1) A renewable energy microgrid to serve their subscribers, and/or;
- 2) Finance mechanisms for their members to purchase and install residential/small business renewable energy that can then be aggregated.

Adaptation: Are We There Yet?

California Microgrid Efforts:
SB 1339 – Wildfire
Resilience

NYSERDA: NY Prize
Competition to fund testing
of community microgrid
concepts



Transition Trapeze Act

Relocating vulnerable infrastructure

Modifying existing facilities

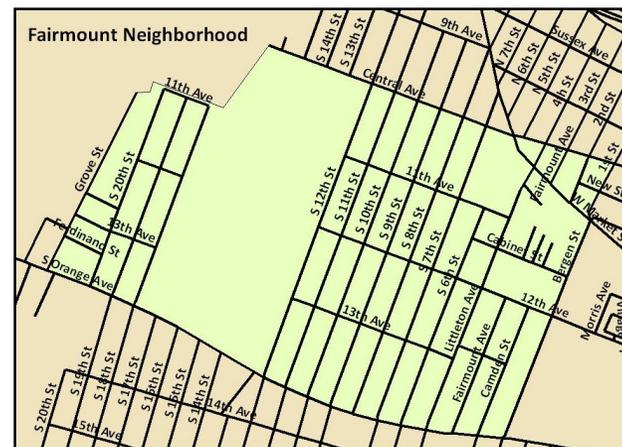
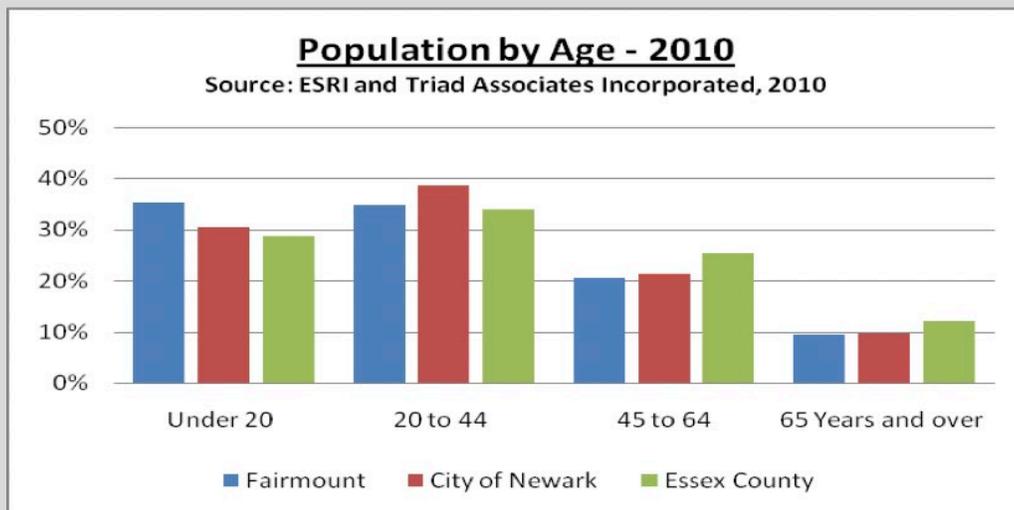
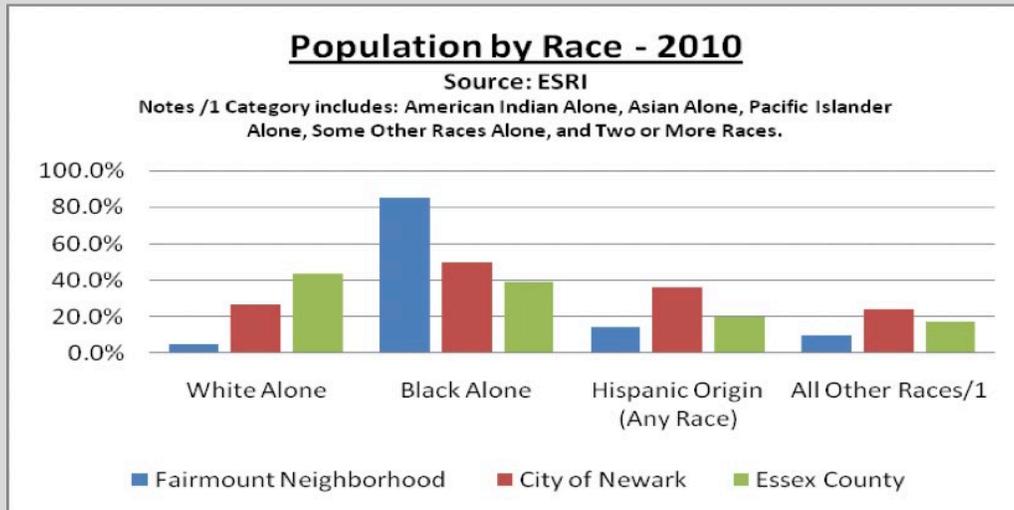
Increasing system capacity

Community Ownership of Renewable Generation



The Case of the Fairmount Heights

Post Super Storm Sandy, PSE&G needed to build a switching station on higher ground in Newark, NJ. It identified a parcel on higher ground of the right size and near load demand.



Data Source: City of Newark

”Mitigation v Adaptation” Shouldn’t Mean That...

- Black communities need to “adapt” to having unwanted facilities disproportionately sited in them with no direct community benefits like jobs and economic investments for the “greater good” of infrastructure resilience.
- Black rural communities host wanted renewable energy generation facilities but do not realize the economic benefits of the investment
- “Electrification” results in disproportionate maintenance costs are borne by a shrinking remainder of gas customers.
- Gas utility workers lose their livelihoods in the transition to electrification.

Balancing Burdens and Benefits

We need to influence policies to ensure that actions to mitigate and adapt to climate change do not create burdens that fall disproportionately on Black communities.

At the same time, we need to exert ourselves to ensure policies and actions direct the benefits of desirable infrastructure investment to our communities for the good of the current residents.

Climate change policies that create net benefits can help our industry be a positive change agent in Black communities as it transforms how we produce, provide, and use energy.

Getting Specific

Good

- Think holistically about community needs and alignment with climate policy and infrastructure needs;
- Stay within your issue area (i.e., “energy” related benefits)
- Adapt facility/infrastructure to community;
- Create a long-term engagement and investment plan;
- Do no harm; Do some good.

Bad

- Consider only company mitigation and adaptation needs in terms of compliance requirements;
- Try to ‘mitigate’ burdens with ‘trinkets’ (EX., Instead of upgraded design, offer playground equipment);
- Take on ‘public goods’ (EX., Improved health as community benefit)
- No adaptation plan
- Transaction, not investment



Quentin Foster
Director, State Affairs
External and Customer Affairs
California ISO

Quentin Foster has been a voice for the working poor throughout California. In 2011, he served State Senator Holly J. Mitchell as a legislative aide and as the Policy Director for the CA Legislative Black Caucus, he collaborated with elected officials and environmental stakeholders to advance equity in environmental policy. Mr. Foster worked to help pass the very ambitious climate goals that calls for a reduction in GHG emissions. He also worked directly with policy makers, and environmental coalitions to extend the state's landmark climate policy, Cap and Trade Program.



California ISO

Adaptation and Mitigation: *CA and the West in the Climate Change Era*

Quentin Foster
Director, State Affairs
CA Independent System Operator

One Of Nine Independent/Regional Transmission Operators (Isos/Rtos) In North America

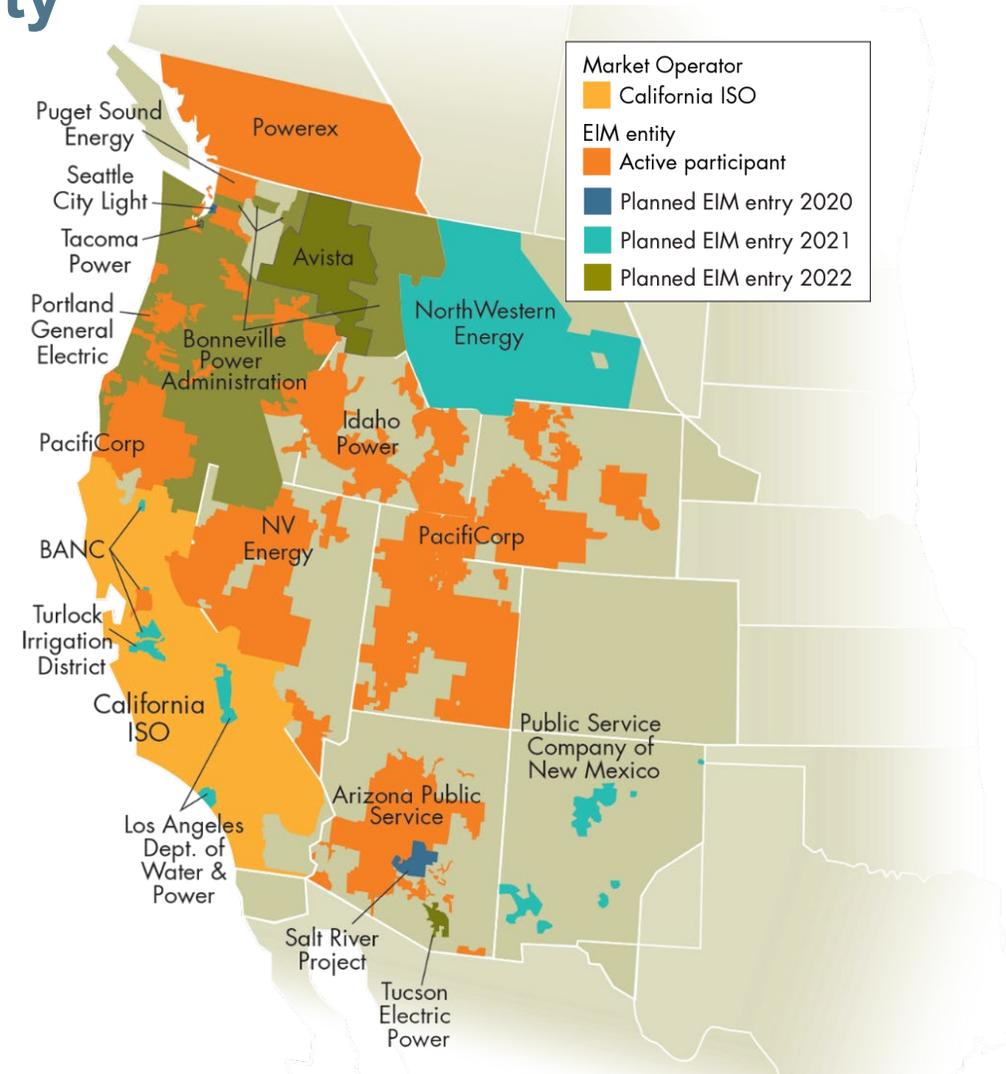
California ISO

- One of 39 balancing authorities in the western interconnection
- Nonprofit public benefit corporation, serving over 30 million consumers
- Serves 80% of California and small portion of Nevada
- Slightly different offerings (E.g, Flexi-ramp)



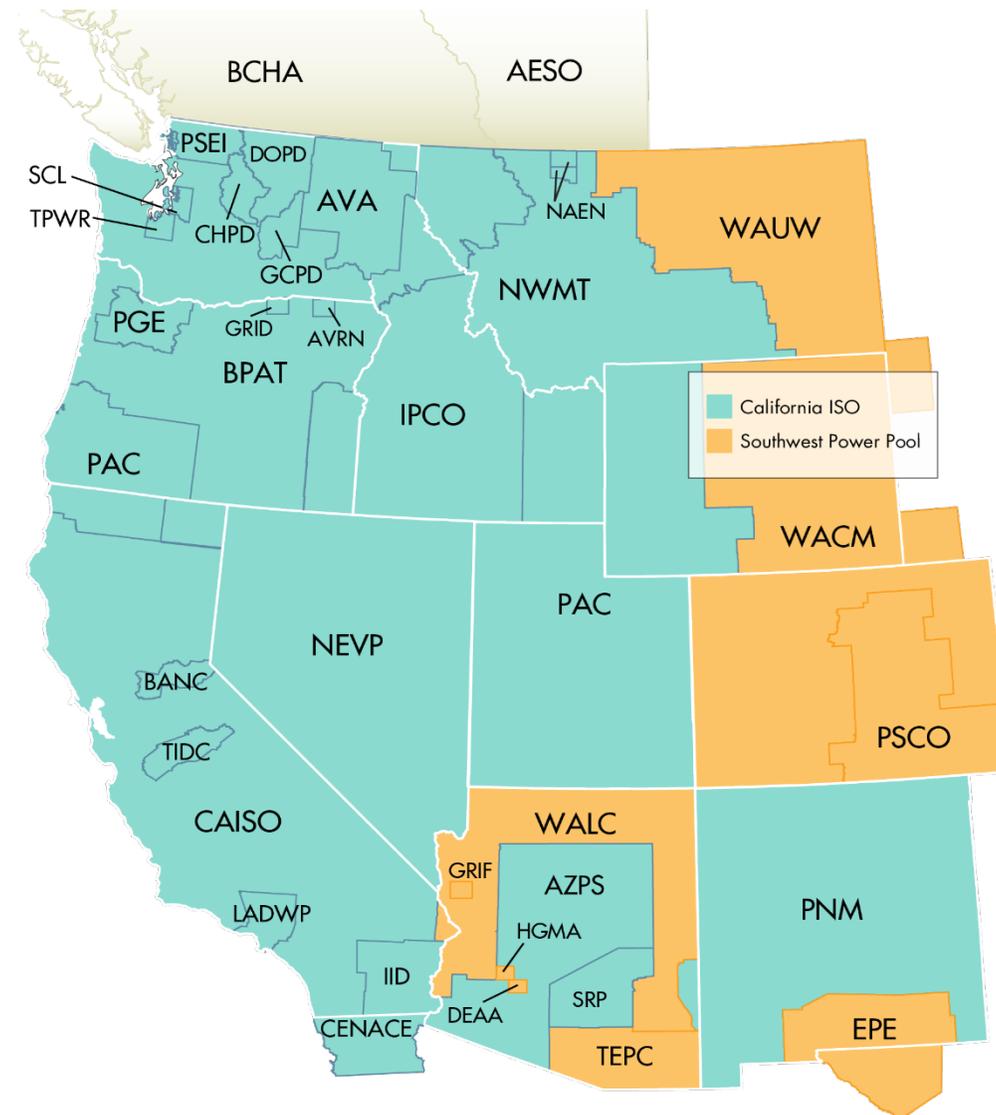
Western EIM Leverages Geographic & Resource Diversity

- Entities committed to EIM span 10 states
- Gross benefits from EIM operation total \$801 million through Q3 2019
- Builds on existing market: automated dispatch minimizes cost, facilitates renewables, resolves imbalance & avoids congestion
- Easily scalable, low-cost, low risk, no exit fees, and adapts to state policies



ISO Expands to RC West Coordinator in 2019

- We are the entity with the highest level of responsibility for reliable operations.
- We leveraged our existing technologies to enhance the services provided by our successor at a reduced cost for all
- Broad purview to enable the calculation of interconnection reliability operating limits that may be beyond other operators' vision



BA boundaries are approximate and for illustrative purposes only

California Attempts to Adapt and Mitigate

Cap and Trade - Launched in 2013, California's program is the fourth largest in the world. California's emissions trading system is expected to reduce GHG emissions by more than 16% between 2013 and 2020, and by an additional 40% by 2030.

Electrification – Local governments like Berkely have mandated all new construction be solely electric. No natural gas.

Closing Plants – California has aggressively passed legislation that shuts down once-through-cooling plants along the coast, nuclear facilities, etc.

RPS Goals – California's big strategy to reduce total greenhouse gas emissions to 1990 levels by 2020 and 40 percent below 1990 levels by 2030.

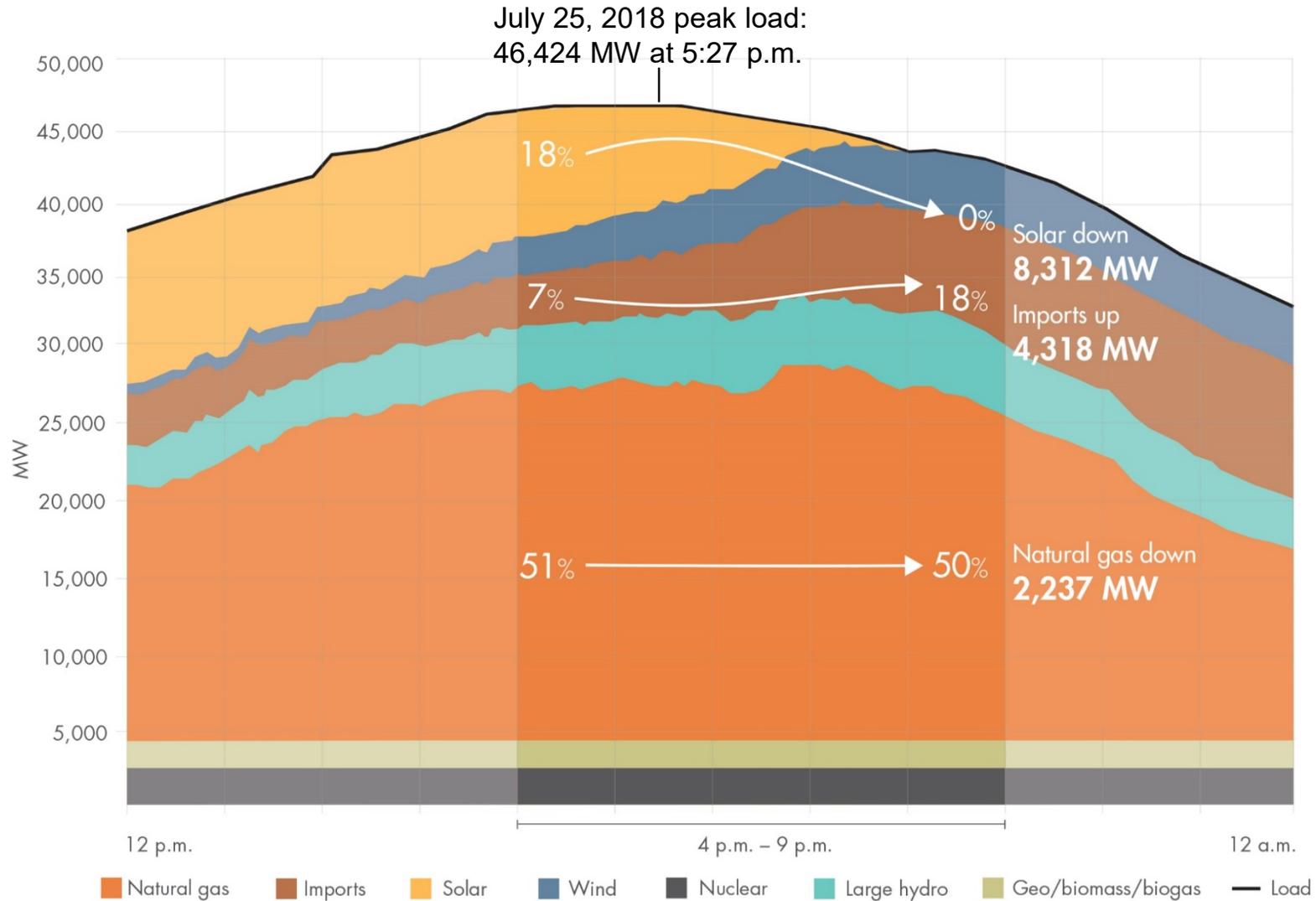
Climate And Renewable Integration Creating New Challenges for Grid Reliability

- **Challenge 1: Capacity Shortfalls And Meeting Summer Evening Peak Load (Medium/Long Term)**
- **Challenge 2: Increased Ramping Needs (Near/Medium/Long Term)**
- **Challenge 3: Low Renewable Energy Production From Multi-day Weather Events (Long Term)**

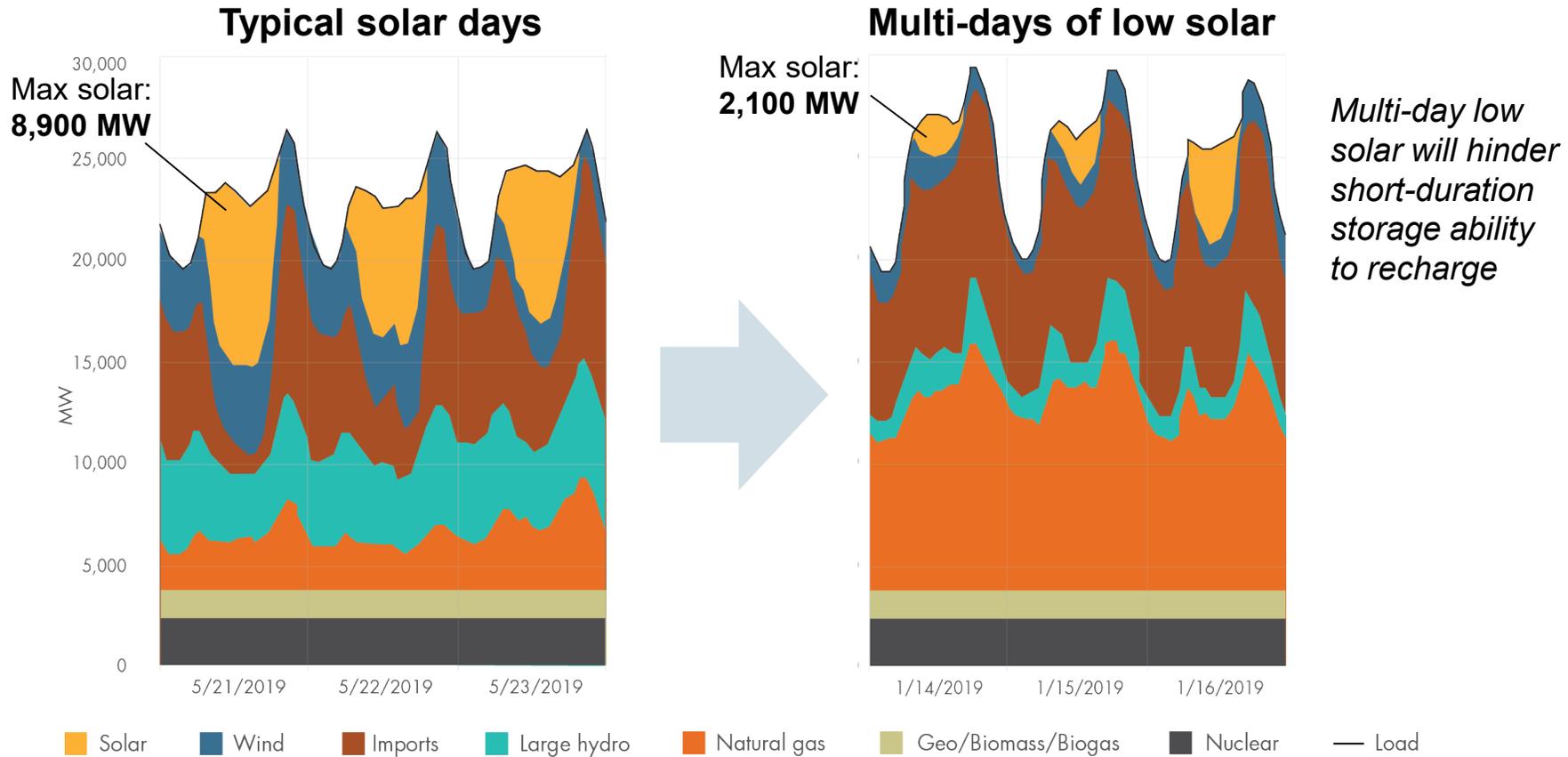
Challenge 1: Capacity Shortfalls & the Summer Evening Peak Load

- Solar production is significantly reduced or not available during these new, later peak demand hours. To account, we have relied on energy from natural gas resources and imports
- However, energy capacity is decreasing for a number of reasons:
 - Net retirement of 4,000 MW of once-through cooling steam generation (Vis-à-vis state legislation closing plants)
 - Reduced imports due to increasing load, thermal resource retirement, and increasing renewable integration needs outside of California
 - Early retirement of natural gas plants because they are no longer economically viable (unintended consequences)

Challenge 2: Increased Ramping Needs



Challenge 3: Low Solar Production Across Multi-day Event



The Kauai Experience (2019)

- Kauai Island Utility Cooperative – approx. 70MW of load
- Loss of gas generation – 27.5 MW
- All hydro resources on maintenance outage – 16 MW
- Major storm caused low solar production for multiple days
- Solar – Battery storage unable to serve load each day
 - A. 28MW solar with 100MW-hr storage (4hr)
 - B. 13MW solar with 52MW-hr storage (4hr)
- Result: initial outage of 2 hrs, 2 days rotating outage of 30 min for 3-4 hrs in early morning hours
- Restored regular service after offline generation was put into service and solar production was increased

Looking Ahead: Trends & Strategies

- Every state is aggressively creating their own RPS targets; reducing the number of imports available
- New technologies can be helpful, but may present new challenges
- Federal actions, like repealing the Clean Air standards, will only incentivize states to craft their own responses. Less uniformity leads to more forecasting errors and less coordination.
- Increased coordination, like EIM, is necessary. Which is why we are in a stakeholder process exploring a EDAM option for market participants.



Q&A